STAR TPC Installation at BNL

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The STAR detector is under construction at Brookhaven National Laboratory. At its heart lies a large Time Projection Chamber (TPC). The TPC was built at the Berkeley Lab and was transported to BNL in November of 1997. Since that time, it has been outfitted with all of the STAR read-out electronics, ancillary systems, and has been integrated with the STAR conventional facilities. It was installed in the magnet on December 2, 1998. (See figures one and two.)

The primary activity by Berkeley Lab scientists at BNL was to test the TPC systems and to integrate them with the rest of the detector components that are arriving from around the world.

The TPC flew from Berkeley with all of its pad plane sectors installed but minus any of the readout electronics. After arrival, we tested each sector for damage, removed and repaired three, and proceeded with the installation of the front end electronics boards (FEE). Systematic tests of the anodes, cathodes, and pad planes demonstrated the basic integrity of these systems. A key element of these tests was to ensure that the sectors performed well when integrated into the full TPC.

Additional integration tests were conducted with a prototype Gating Grid driver, Anode, and Cathode control systems, and the STAR slow controls interface.

In parallel with the electronics installation and testing, we installed a large supply and re-circulation system which provides clean P10 gas.
We achieved our goal of running cosmic rays through the TPC in October and November of 1998. We took data in six sectors (out of a total of 24) and we have a large sample of cosmic events stored on tape. These events are now being used to study the alignment of the individual sectors and to search for bad channels and FEE boards.

The cosmic ray tests concluded in time for the installation of the TPC in the STAR magnet. Currently, the TPC is inside the magnet and is undergoing its final assembly and connection to gas, water, and electrical systems.

The RHIC facility is scheduled to begin accelerating beams on May 15th, and we hope to record a small sample of collision events by the end of July.

Figure One: Installation of the TPC in the STAR magnet.

Figure Two: Installation was completed on December 2nd, 1998.